



JACQUELINE MCBRIDE/TID

Using the overhead crane, Jacobs ironworkers lower the main amplifier bus into its designated place in the NIF laser bay. The amplifiers will increase optical energy of the 192 laser beams.

Amplifiers are NIF's crown joules

By Sue Stephenson

PUBLIC AFFAIRS

Amplifiers are to NIF, what the heart is to the human body; they pump energy into the system. NIF amplifiers increase the optical energy of each of the 192 laser beams from one joule to 20,000 joules. NIF is 40 times more powerful than its predecessor, Nova, due to its multipass amplifier architecture.

Because amplifiers are so critical to the system, and because researchers want to minimize NIF's down time for maintenance

and repairs, the amplifier was designed as a Line Replaceable Unit (LRU) that cleanly slides into its many specific locations in the NIF system. LRUs are self-contained packages that consist of replaceable components that can be assembled and tested off-line, in a clean room, and quickly installed or replaced in NIF as a unit, while preserving their highly clean and pre-aligned state. There are 3,500 amplifier LRUs in NIF.

The LRU is able to slide into place because of a specially created framework, or

See **NIF**, page 8

Lab collaborations get \$23 million to advance science research on supercomputers

By Anne M. Stark

NEWSLINE STAFF WRITER

The Lab has received more than \$23 million to research a variety of subjects from supernovae to climate modeling to plasma microturbulence to supercomputer simulation tools.

The funds are part of a series of grants from the Department of Energy through its new Scientific Discovery through Advanced Computing (SciDAC) program. The money will be used to advance fundamental research in several areas including climate modeling, fusion energy sciences, chemical sciences, nuclear astrophysics and high performance computing.

SciDAC is an integrated program that will help create a new generation of scientific simulation codes by using the computing capabilities of terascale or supercomputers (those capable of doing trillions of calculations per second) to address larger, more complex problems. In addition, the program will develop collaborative software that will enable geographically separated scientists to effectively work together as a team to share data more readily.

Most of the Lab's programs are collaborative projects with partners including other national laboratories, universities and research institutions. The Lab collected a total of \$23.9 million to help fund 10 separate projects. Livermore researchers lead two of the 10 projects.

One such project, the SciDAC Center for Supernova Research involves Livermore astrophysicists Rob Hoffman and Frank Dietrich of N-Division. Chris Fryer and Mike Warren of Los Alamos National Laboratory; Stan Woosley and Gary Glatzmaier of UC Santa Cruz and Adam Burrows and Phil Pinto of the University of Arizona have teamed up with Livermore to model supernovae, to discover how these explosions

See **FUNDS**, page 3

Lab expertise helps blow open bomber case

By Don Johnston

NEWSLINE STAFF WRITER

Laboratory expertise in forensic analysis played a key role in the recent conviction of "Fremont bomber" Rodney Blach, according to an Alameda County district attorney.

Blach was found guilty of 11 felony counts, including attempted murder, by a jury June 1 after an 11-week trial. He was arrested in October 1999 and charged with planting six bombs in Fremont, some targeting local government officials. Four of the pipe bombs exploded, and two were found and disarmed before they detonated, all in a 72-hour period in the last week of March 1998.

Brian Andresen of the Laboratory's Forensic Science Center (FSC) was among the technical experts asked by prosecutor Tom Rogers, assistant district attorney, to assist in the investigation and to testify. "His work and expertise were invaluable to our successful prosecution," Rogers said in a letter to Harry Vantine, leader of the Counterterrorism and Incident Response Program (R Division) in the NAI Directorate.

Andresen was brought into the investigation of the bombings to help investigators from the federal bureau of Alcohol, Tobacco and Firearms (ATF) reconstruct what Roger's characterized as

See **BOMB**, page 8

Lab garners 8 of 11 UC campus-lab collaborative projects and exchanges

Laboratory researchers have been awarded eight of UC's 11 recently announced research projects and exchanges to be carried out collaboratively between laboratories and university campuses.

Among the projects, researchers will probe a pathogen implicated in respiratory, heart and Alzheimer's diseases, develop a laser approach to diagnosing breast cancer non-invasively, and explore new ways to use gamma ray detectors

See **CAMPUS**, page 5



The world on a string

— Page 2



Acquiring desktop know-how

— Page 4



Medals for manufacturing

— Page 5



LAB COMMUNITY NEWS

Weekly Calendar

Technical Meeting Calendar, page 4

Monday 27 The **Elder Care Support Group** will meet at noon in the Press Room, Trailer 6575 (by the East Visitors Center). Janice Butler will share her experiences in caring for an elder from a distance. She will share a set of questions she developed to use when talking to elders on the phone and offer tips on building a network from afar. Reservations are not required. Family members are welcome. Bring your lunch and invite a friend. Contact: Marnette Yeager, 2-1217.

Tuesday 28 The **LLESA Apple Computer Networking Group** meets at 7 p.m. in the LLNL Visitors Center Press Room. Anyone with an interest in Apple brand and compatible computers is welcome. Contact: Jim Branum, 2-6766.

Wednesday 29 The local sections of the American Nuclear Society and the American Institute of Chemical Engineers are hosting an evening with **Rep. Ellen Tauscher**, beginning at 5:30 p.m., at the Hungry Hunter restaurant in Pleasanton. She will speak on topics of interest to the local technical and professional community. Register on-line at <http://www.aiche-norcal.org>, or leave messages at 510- 881-7732 by 11 p.m., Aug 26. Please state your dinner selection from the choices on the AICHE Web page.

• • •
If you would like to enter your vehicle in the 12th annual **LLESA Vintage Vehicle Show** on Thursday, Sept. 13, you must register by today. Show classifications include: vintage (pre '55), classic (pre '65), factory muscle, street rods, sports cars, motorcycles, kit cars, under construction, and other vehicles. To register, contact the LLESA Office, 2-9402.

Thursday 30 Amigos Unidos is hosting a get-acquainted session at noon in Bldg. 415, room 239, for anyone interested in finding out more about its weekly **conversational Spanish classes**. Fall classes begin the week of Sept. 2. Ongoing classes are held Monday through Wednesday, while new beginners classes are scheduled to meet on Thursday. Each one-hour class meets once per week. All classes are held in Bldg. 415, room 239. Cost of the class is \$60, which pays for 12-16 weeks, depending on the number enrolled. Contact: Ken Marsh, 2-2488.

Friday 31 The Benefits Office's brown-bag series continues with a session at 12:15 p.m. in Bldg. 571, room 2301, on how to enhance your financial security by participating in the **Tax-Deferred 403(b)**. No pre-registration is required. Bring your lunch and your questions. For more information, go to www.llnl.gov/jobs/benefits.

Strings attached



JULIE KORHUMMEL/NEWSLINE

It took John Carbino, a mechanical technical coordinator in Engineering, one year to amass this string ball. It weighs 30 pounds and has a 55-inch circumference. He originally started collecting string as part of his recovery from heart surgery.

Lab set to unveil business development center

By Anne M. Stark

NEWSLINE STAFF WRITER

The Livermore Lab in conjunction with the Tri-Valley Business Council will host the opening and a tour Wednesday of the Tri-Valley Technology Enterprise Center.

Employees are invited to attend the event which begins at 10 a.m. in the picnic area between the TTEC Facility and the Laboratory pool.

The Tri-Valley Technology Enterprise Center is a business development center supporting emerging companies and pilot operations of established firms by providing business services, facilities, training, and access to advisers and mentors in areas such as business operations and management, technical specialties, sales and marketing, financial, legal and banking.

The center will also assist the Technology Commercialization and Transfer Programs of Lawrence Livermore and Sandia national laboratories by helping with the exchange of technology information and the establishment of partnerships between the laboratories and businesses.

Speakers at the event include: Rep. Ellen Tauscher, Livermore Mayor Cathie Brown, TTEC Chairman Richard Couch, Phil Wentz, chairman of the Tri-Valley Business Council, and Livermore Lab and Sandia representatives.

TTEC's goal is to assist start-up and early stage companies in becoming successful and sustainable so that they ultimately generate economic vitality and community benefits to the region.

The center will support businesses in the industries of information technology, biotechnology, biomedical devices and other breakthrough technologies originating from the national laboratories' commercialization programs and the Tri-Valley area.

TTEC resulted from a unique collaboration between the Tri-Valley Business Council, LLNL, Sandia, the City of Livermore and Tauscher's office. Financial sponsorship of the project has been provided by Crosby, Heafey, Roach and May, J. S. Kendall Construction, Pacific Gas & Electric, Tanner Insurance Brokers, the University of California and the Economic Development Alliance for Business.

For more information, visit <http://www.trivalleytec.com> or call (925) 273-0232.

IN MEMORIAM

William Brunner

Retired Laboratory mechanical engineer William "Bill" Brunner died Tuesday, Aug. 21, after a short illness. He was 82.

Born in Crookston, Minn., Brunner graduated from Missoula State College in Montana with a degree in Forestry. He later moved to Oakland, and went to work at the University of California Berkeley Radiation Laboratory in 1951. Brunner came to Livermore in April 1952 and worked at the Lab until his retirement in 1978.

Brunner served as head of Mechanical Engineering's Vacuum Processes Department and in 1958 developed on-site training in "practical vacuum techniques." He also co-authored a book entitled "Practical Vacuum Techniques."

Brunner is survived by his son Bill Brunner of Livermore; daughter Ginny Brunner-Ray of Antioch and a sister, Dorothy Hoff of Tigard, Oregon.

Newsline

Newsline is published weekly by the Internal Communications Department, Public Affairs Office, Lawrence Livermore National Laboratory (LLNL), for Laboratory employees and retirees.

Contacts:

Managing editor: Lynda Seaver, 3-3103

Contributing writers: Sheri Byrd, 2-2379; Don Johnston, 3-4902; Elizabeth Rajs, 4-5806; David Schwoegler, 2-6900; Anne Stark, 2-9799; Steve Wampler, 3-3107; Gordon Yano, 3-3117. For an extended list of Lab beats and contacts, see <http://www.llnl.gov/llnl/06news/NewsMedia/contact.html>

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e-mail: newsline@llnl.gov or newsline@llnl.gov
Web site: <http://www.llnl.gov/PAO/>

AROUND THE LAB



FUNDS

Continued from page 1

occur, and to study in detail the complex physical processes that take place in supernovae.

Though initial year funding starts out with \$520,000, Hoffman said the three-year Office of Science grant totals \$2 million.

"With this grant, we are trying to understand some of the most challenging issues in theoretical and computational physics," Hoffman said. "These processes include hydrodynamics, neutrino and radiation transport, the nuclear equation of state, convection, thermonuclear fusion and flame propagation. These are precisely the issues at the forefront of research at the national laboratories, and progress in these areas advances our national security interests as well as our understanding of basic science."

A supernova is the cataclysmic death of a star, literally the explosion of a star. Observed in nearby galaxies at a rate of more than one per week, these titanic events release immense amounts of energy that can temporarily rival that of their host galaxy. "A supernova releases as much kinetic energy as the sun will radiate over its entire lifetime," Hoffman said. "They are the best bang since the big one."

Other LLNL SciDAC projects and first year funding include:

- The Plasma Microturbulence Project with General Atomics, Princeton Plasma Physics Laboratory, University of Maryland, University of Colorado and UCLA. \$450,000.

- Collaborative Design and Development of the Community Climate System Model for Terascale Computers with Los Alamos, Oak Ridge, Lawrence Berkeley, Pacific Northwest and Argonne national laboratories and the National Center for Atmospheric



This is a simulation of the density profile of a 1 solar mass main sequence star (just like the sun) after shock wave passage from a Type 1a supernova (which "went off" above the top of the image). This is a fairly late time picture, perhaps a day or so after the explosion. The dark spot represent the density of the "core" of the main sequence star, inner grey parts are less dense material from the envelope, white is material being stripped from the envelope, outer gray areas are the background density after the supernova shock has passed.

Research. \$4 million.

- Earth System Grid II: Turning Climate Data sets into Community Resources with Argonne and Oak Ridge national laboratories and the University Center for Atmospheric Research. \$1.82 million.

- High-End Computer Systems Performance: Science & Engineering with Lawrence Berkeley, Argonne and Oak Ridge national laboratories, University of Tennessee, University of Illinois, University of Maryland and UC San Diego. \$2.4 million.

- Center for Component Technology for Terascale Simulation Software with Argonne, Los Alamos, Oak Ridge, Pacific Northwest and Sandia national laboratories, Indiana University and the University of Utah. \$3.1 million.

- Scientific Data Management Enabling Technology Center with Argonne, Lawrence Berkeley and Oak Ridge national laboratories, Georgia Institute of Technology, North Carolina State University, Northwestern University and UCSD. \$3 million.

- Terascale Optimal PDE Simulations (TOPS) with Argonne and Lawrence Berkeley national laboratories, Old Dominion University, New York University, Carnegie Mellon University, UC Berkeley, University of Colorado and the University of Tennessee. \$3.3 million.

- Terascale Simulation Tools & Technologies Center with Brookhaven, Argonne, Oak Ridge, Pacific Northwest and Sandia national laboratories, Rensselaer Polytechnic Institute and State University of New York Stony Brook. \$2.6 million.

- Algorithmic and Software Framework for Applied Partial Differential Equations with Lawrence Berkeley National Laboratory, New York University, University of Washington, University of North Carolina, UC Davis and the University of Wisconsin. \$2.7 million.

Updated Web browser standards ensure function, security



CIO Update

By Ted Michels

LLNL's Information Architecture (IA) Project has been the focal point for building and strengthening this Laboratory's information technology infrastructure since 1998. For this purpose, the Lab-wide IA Advisory Board (IAAB) was chartered by the LLNL CIO to guide the establishment of the standards and technical support required to enable that infrastructure to grow and mature.

The objectives of this work include enabling Laboratory employees to obtain maximum functionality from information technology, to collaborate with colleagues successfully and securely, and to obtain maximum value from the dollars spent on information technology at the Laboratory.

The standards that have been established by the IAAB and the process by which standards are developed and approved are described at <http://ia.llnl.gov/standard.html>.

The IAAB announced this week a product standard for Web browsers on LLNL desktops. This standard was first proposed by the Web Working Group at LLNL and enables developers to write Web-based

applications that will work on most desktops at LLNL. It also assures LLNL users that those applications will run on their machines.

The standard specifically recommends browsers, plug-ins, programming environments, media players and viewer applications for the two dominant computer platforms used at LLNL: Macintosh and PC/Windows.

The standard

Any standard adopted by a large institution such as LLNL must be based on both the requirements of the user community and on industry standards to ensure that users can achieve the maximum functionality. The LLNL standard "Webtop" achieves the required functionality with the following components:

- Netscape and/or Internet Explorer browser
- External Java Virtual Machine (for Mac), MS Java VM (for Windows)
- JavaScript
- QuickTime
- Real Player
- Windows Media Player
- Adobe Acrobat Reader

See <http://ia.llnl.gov/standards/ia1501/ia1501.html> for the full text of the standard.

The standard recommends that, where possible, desktops should be configured with both Netscape and Internet Explorer to allow for use of Web applications that do not execute properly with one or the other.

The recommended versions of these components and the hardware configurations that support them will be kept up to date on the IA Desktop Standards

Website at: <http://dag.llnl.gov/default.lasso>.

This standard does not apply to Personal Digital Assistants (PDAs) or other handheld Internet appliances.

Implementation

Lab personnel who install and configure Web browsers for LLNL users are responsible for ensuring that Web browsers, plug-ins, application runtime environments, media players and viewer applications conform to this standard. Web application developers need to make sure that their products will run properly on LLNL's standard desktops (i.e., Macintosh and Windows) and, where possible, on LLNL's commonly used UNIX systems (i.e., Sun Solaris and Linux). The IA testing laboratory is available for verifying these compatibilities.

The list of standard "Webtop" components will be reviewed 3-4 times each year. Laboratory groups are welcome to propose the addition of new components to the standard; they will be evaluated based on their functionality, the cost of deployment and conformity to existing institutional policies and practices.

Benefits

Users of desktops that conform to this standard will be able to access and use the full capabilities of any conformant LLNL Web-based application.

Ted Michels is the principal deputy associate director for Computation and LLNL's acting Chief Information Officer (CIO).



NEWS YOU CAN USE

TSD's services and products are featured in redesigned Website, brochure collection

The Telecommunications Systems Department (TSD) has redesigned its Website and developed a comprehensive collection of brochures aimed at familiarizing LLNL employees with the telecommunications products and services available to them. The new Website and product and service brochures were designed to make it easy and convenient for Laboratory employees to gather detailed information about the telecommunications products and services available.

Both large and small-scale products and services are available, and new products and services are continually being researched based on the Laboratory's needs.

"Our goal is to help the Laboratory meet its mission by providing the necessary telecommunications tools. Whether it's as simple as providing dial tone or delivering a more advanced telecommunications solution such as Interactive Voice Response, TSD is committed to helping the Laboratory meet all its telecommunications needs," said Irv Eachus, TSD department head.

On Wednesday, a complete set of product and service brochures will be distributed to area telephone representatives (ATRs), resource analysts, and Laboratory administrative committee members.

The new Website will also be accessible on Wednesday and can be accessed at www-tsd-r.llnl.gov.

See your ATR or resource analyst to view the product and service brochures, or contact TSD's customer liaison, Amy Muller, 2-8727, to request copies.

Desktop Acquisition Group answers questions

Editor's note: This is the first in a series of questions and answers about the new Web-based ordering system for the purchase of Dell and Apple desktop computers. All employees are encouraged to use this new system. This URL can be used to access the on-line ordering system: https://www.ais.llnl.gov/llnl_plsql_la_auth/rq.eqp_ord_pr1

Question: Once a Dell or Apple computer is delivered to the end-user's desktop, will we have to move our existing files from our old computer to the new computer?

Answer: GMR will not provide this service. Each end-user is responsible to contact his or her local SND Computer Support Unit for assistance in moving existing files to the new computer system. For a list of CSU contacts, go to <http://snd.llnl.gov/cgi-bin/snd/csu.pl>.

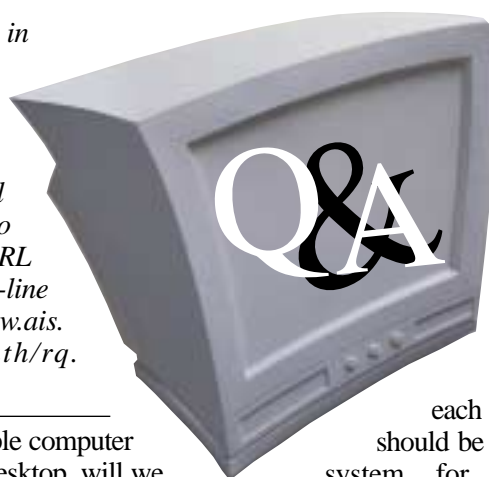
Q: Once the Dell or Apple computer is delivered to the desktop, how do I obtain my network connection?

A: Contact your local Computer Support Unit for assistance. For a list of CSU contacts, go to <http://snd.llnl.gov/cgi-bin/snd/csu.pl>.

Q: Are you obligated to purchase a monitor with every desktop computer?

A: No

Q: After a Dell or Apple computer has been set up on



the end-user's desktop, can we purchase peripherals?

A: Yes

Q: Will the standard configurations be posted and updated at all times?

A: Yes, the Web page will be updated as new computer configurations become available from each manufacturer. The following URL should be used to access the on-line ordering system for Dell and Apple computers: https://www-ais.llnl.gov/llnl_plsql_la_auth/rq.eqp_ord_pr1

Q: Can systems be purchased with Linux?

A: Yes. The Dell Blanket Agreement will remain open for the purchase of Dell server class machines and workstation machines containing Red Hat Linux operating systems only. Server class machines are defined as PowerEdge Rack Servers, PowerEdge Performance Tower Servers, PowerEdge SC Value Tower Servers, and PowerApp Appliances. Reference the following URL: http://www.dell.com/us/en/esg/topics/seg-topic_servers_server_main.htm

Q: After a Dell or Apple is delivered to the end-user's desktop, is it possible to add additional components to these computers without voiding the warranty.

A: Yes, new components and peripherals may be added without voiding the warranty. If any added component(s) are found to cause system problems, the user may be asked to remove them before the system can be repaired.

Technical Meeting Calendar

Friday
24

FISSION ENERGY & SYSTEMS SAFETY PROGRAM

"Nuclear Isomers," by John A. Becker, Friday, 1:30 p.m., Bldg. 170, room 1091 (uncleared area). Contact: Ed Jones, 2-8259.

INSTITUTE FOR SCIENTIFIC COMPUTING RESEARCH

"Interactive Visualization of Large Graphs and Networks," by Tamara Munzner, Compaq Systems Research Center. 11 a.m., Bldg. 451, room 1025 (uncleared area). Contacts: Valerio Pascucci, 3-9422, or Leslie Bills, 3-8927.

Monday
27

CENTER FOR GLOBAL SECURITY RESEARCH

"The Application of Isotope Separation in the Atomic Industry and Medicine," by Vladimir Baranov, Kurchatov Scientific Center, Moscow. 10 a.m., Bldg. 132S, room 1781 (open area). Contact: Tami Alberto, 2-5969.

MATERIALS SCIENCE & TECHNOLOGY

"Development of High Carbon Fe-Al Alloys for Tribological Applications," by Su-Ming Zhu, Japan Ultra-High Temperature Materials Research Institute, 10:30 a.m., Bldg. 235,

Gold Room (uncleared area). Contact: T.G. Nieh, 3-9802, or Roberta Marino, 3-7865.

MATERIALS RESEARCH INSTITUTE

"Multi-electron Bubbles Under Pressure," by Isaac F. Silvera, Lyman Laboratory of Physics. 3:30 p.m., Bldg. 219, room 163 (open area). Contacts: Bill Nellis, 2-7200, or Miriam Rinnert, 2-7369.

Wednesday
29

MATERIALS RESEARCH INSTITUTE

"Optical and Dynamic Properties of Semiconductor Nanoparticles: Effects of Quantum Confinement and Surface," by Jin Zhang, UC Santa Cruz, 3:30 p.m., Bldg. 219, room 163 (open area). Contact: Mike McElfresh, 2-8686, or Miriam Rinnert, 2-7369.

Friday
31

INSTITUTE FOR SCIENTIFIC COMPUTING RESEARCH

"Prefetching and Caching Strategies for Modern Memory Systems," by Steven Reinhardt, University of Michigan. 2 p.m., Bldg. 451, room 1025 (uncleared area). Contacts: Bronis de Supinski, 2-1062, or Leslie Bills, 3-8927.

Sept.
5

INSTITUTE FOR LASER SCIENCE AND APPLICATIONS

"PWT Photoinjector Linac and

Applications in Compton Backscattering X-Ray Source," by David Yu, DULY Research, Inc., 9:30 a.m., Bldg. 219, room 163 (open area). Contact: Fred Hartemann, 3-3398, or Mary Ann Soby, 3-1102.

CHEMISTRY AND MATERIALS SCIENCE

"Real-Time Experiments in the Transmission Electron Microscope," by Ian M. Robertson, University of Illinois. 11 a.m., Bldg. 235, room 1090 (uncleared area). Contacts: Glenn Fox, 2-0455, or Kathy Gonzales, 3-7023.

Sept.
25

CHEMISTRY & MATERIALS SCIENCE

"The Materials and Chemistry of NIF," by Jack Campbell, discussing optical materials for high power lasers. 10:30 a.m., Bldg. 543 auditorium (uncleared area). Contacts: Tomás Díaz de la Rubia, 2-6714, or Lisa Rose-Webb, 2-5609.

The deadline for the next Technical Meeting Calendar is noon, Wednesday.

Send your input to tmc-submit@llnl.gov. For information on electronic mail or the news-group llnl.meeting, contact the registrar at registrar@llnl.gov.

NEWS OF NOTE



Interns hold national title in manufacturing design

By Stephanie Esposito

NEWSLINE STAFF WRITER

Teamwork, skill and a little bit of luck helped three San Joaquin Delta College students win a gold medal for the 37th annual SkillsUSA-VICA National Leadership and Skills Conference held this past June at the Kemper Arena in Kansas City, Mo.

Lab summer interns Robert Berry and Scott Fisher from the New Technologies Engineering Division, along with Steven Arguello from the Laser Science Engineering Division, worked together as a team against 20 other competing schools from across the nation.

In order to participate in the competition, contestants had to be members of VICA (Vocational Industrial Clubs of America), a national organization for high school and college students interested in or training for technical, skilled and service occupations. This conference included 72 different contests that focused on skill and leadership, in which Berry, Fisher and Arguello entered as a team in the Automated Manufacturing Technology Competition.

In this particular contest, teams were evaluated as though they were a small company being hired to construct a product for a customer. The judges decide the problem or product that the team must design, thus acting as the mock customer. Each team is first given a booklet of instructions that they must follow and complete in order to qualify for a medal.

After receiving their booklet of instructions, Fisher remembered feeling a little overwhelmed. "We just sat there and read the booklet for 45 minutes," he said.

"Then Steve just started to draw the dimensions of what we thought (the judges) wanted," Berry said. "First you try to figure out, what do they want us to do? What do they want us to draw? Do they want a mold or a physical part?"

Once the instructions were distributed, each team had eight hours to complete the project. Each team member had to be able to perform specific technical tasks during the competition while also being judged on accuracy, speed, price quote and the amount of parts within the project.

"Teams had to break down the project into basic steps," Arguello said. "There's prototyping, cost analysis and then producing a final product."



MICHAEL ANTHONY/TID

Robert Berry (left) and Scott Fisher display their national medals from the Skills USA-VICA automated manufacturing technology competition. Team member Steven Arguello not pictured.

Each member had a specific job within the group. Arguello was the computer-aided design (CAD) operator, constructing and designing the product using math and drafting. Berry was the computer-aided manufacturing (CAM) operator, generating the tool paths for the product using a coding system. Fisher operated the computer numerical controls (CNC), setting up and machining the part. Fisher

was also the member most responsible for documenting all the product design steps.

When asked how they prepared for a competition with no idea of what the judges would want, Fisher said, "You practice on everything you can."

The only aspects of the competition that all teams know of ahead of time is that some sort of mechanical part must be designed and produced at the end of the eight-hour contest.

"It was hard not to feel intimidated, each state has at least four teams each (represented at the contest), and they all had to beat a lot of teams in regional and state competitions, so we knew they would be hard to beat," Berry said.

Yet, only three other teams were able to complete enough of the project to qualify for a medal. According to the team members, the judges used a program for the product's dimensions that most of the contestants were not prepared to use.

"We were basically done with the part," Fisher said. "There was just one little thing left that would've taken 15 seconds to finish, but we were out of time."

The final result was a bracket about five inches by four inches, designed and cut, although the judges were also seeking a mold for the part.

"They seemed to be packing as many challenges as possible into one part," Berry said.

Besides the employment experience gained at the Skills Conference, the team members are also focusing their studies at San Joaquin Delta College to their fields of interest. Berry and Fisher are both studying mechanical engineering while Arguello has a year left at Delta with a technical drafting major. Fisher is hoping to stay at the Lab as a part-time worker while still going to school.

The three were recruited as summer interns through an outreach contact at their college.

Berry's supervisor for the summer, Carl Bruns of New Technologies Engineering, reports that the award-winning intern's summer project of designing an electron spectrometer will be of use to the department long after the student returns to school in the fall.

"The work we did in the competition carries over perfectly into our jobs here," Berry said.

SkillsUSA-VICA's goal for the competitions is to prepare students with an interest in a technical field for future employment in manufacturing technology fields.

CAMPUS

Continued from page 1

developed for astronomy in medical imaging.

"Programs like this really show UC's commitment to the scientific vitality of the Laboratory. It is a great benefit of the University being our manager," said Laura Gilliom, director of the Lab's University Relations Program. "UC takes some of the management fee DOE pays and puts it into collaborations like this. We had a number of strong proposals and we did well."

The projects and exchanges were chosen competitively and will be funded at a level of \$1.5 million total per year.

"The campus-labs collaboration process is a great opportunity to start projects which strengthen the research environment at the campuses and labs by an exchange of scientists and students, and which can have direct benefits to society," said Harry Radousky, director of Laboratory Collaborations in UC's Office of the President.

"We aim to jump-start and sustain very promising research in areas like health care that can pay off in a big way but may be difficult to fund through standard funding sources."

Five research projects were ultimately chosen from 60 proposed, and six exchanges were chosen from 17 proposed. The collaborations are the latest in a six-year program that was founded in 1995.

Following are the five projects selected, their funding levels for two years and principal contacts:

- A program controlling the optical, magnetic and

electronic properties of semiconducting materials to create novel devices for information processing and storage. \$400,000 per year. Principal contacts: D. N. Bassov, UC San Diego, and P.C. Hammel, Los Alamos.

- A study of how low levels of unwanted radiation exposures that occur near a tumor during radiation therapy affect the genes and proteins in nearby healthy tissue. \$240,000 this year, \$160,000 next. Z. Goldberg, UC Davis, and Christine Hartmann-Siantar, Lawrence Livermore.

- Development of techniques to measure the carbon-14 content of individual amino acids isolated from oceanic organic matter. This innovative approach will provide unique insights into marine ecology, ocean upwelling and global climate processes. \$250,000 this year, \$120,000 next. P.L. Koch, UC Santa Cruz, and Thomas Guilderson, Lawrence Livermore.

- Development of non-invasive techniques for the diagnosis of breast cancer using optical lasers. \$270,000 this year, \$160,000 next. Robert C. Brasch, UC San Francisco, and Stavros Demos, Lawrence Livermore.

- Development of new capabilities in medical imaging using gamma ray detectors that were originally developed for astronomy. \$240,000 this year, \$160,000 next. S.E. Boggs, UC Berkeley, and William Craig, Lawrence Livermore.

Following are the six exchanges, their one-year funding for relocation and related expenses, and their principal contacts:

- A materials science study with a range of applications: for example, to radiation damage, solid oxide fuel

cells and ceramic reactor fuels. \$60,000. Principal contacts are Alexandra Navrotsky, UC Davis, and R. Putnam, Los Alamos.

- A study, in hopes of leading toward a vaccine, of the pathogenic characteristics of the bacteria chlamydia, which has been implicated in a range of illnesses from respiratory infections to heart disease, stroke, attacks on the central nervous system and Alzheimer's. \$30,000. Elena Peterson, UC Irvine, and Vladimir Motin, Lawrence Livermore.

- Development of catalytic flow technology for very small, long lasting fuel cells to provide power for telemetry and other remote applications. \$70,000. Costas Grigoropoulos, UC Berkeley, and Jeff Morse, Lawrence Livermore.

- A study, using a technique called accelerator mass spectrometry, of the means by which carbon can be stored in or released by the soil and the implications for climate change and global warming. \$72,000. Caroline A. Masiello, Lawrence Livermore, and O. A. Chadwick, UC Santa Barbara.

- Development of targeting agents to make cancer cells more susceptible to damage by radiation and thereby improve the effectiveness of therapy using injected radiopharmaceuticals. \$30,000. S.J. DeNardo, UC Davis, and Mike Colvin, Lawrence Livermore.

- An integrated modeling study to promote smart growth in urban areas by taking into account emergency planning issues such as wildfires and storm runoff. \$30,000. K. Clarke, UC Santa Barbara, and S. Rasmussen, Los Alamos.



AUTOMOBILES

1992 - 4 Runner SR5 4x4,V6,5 sp manual,All Power,Cass/CD,moonrf,prvcy glass,K&N,Reg Maint,\$7800 OBO 209-463-0457

1988 - Honda Accord LXI, 5spd, 2door,silver, needs paint on hood & roof,178k miles, have smog certificate, very good condition, first \$2,200 takes it. 925-754-5366

1992 - Lincoln Mark VII LSC, blk ext, lght grey int, loaded, runs excellent and looks great, \$5000, \$200 finders fee if you find buyer and I sell it. 510-538-7444

1984 - VW Rabbit Conv. Excellent condition, new top, clutch, CD player, speakers, & more. 142K miles. Asking \$2500 obo. 510-339-2935

1996 - Kia: see and offer/OK condition. 925-735-6002 925-735-6002

1995 - Honda Odyssey EX - 6 passenger minivan - great condition, first owner, low mileage - call for details. asking \$15,750 925-6002-7953

1966 - 66 Mercury Colony Park station wagon \$1999 925-447-8753

1998 - Toyota Camry LE. Excellent condition. New tires, keyless remote. 55,000 miles. Asking \$13,600. 209-839-9497

1999 - Ford Contour, SE, 43,000 miles, excellent condition, power everything, ABS brakes. \$11K obo. 3-6766. 510-581-7367

1989 - Bronco xlt 5.0 loaded 2nd owner, all maint/service records rblt mtr/trans \$5,250obo 925-846-0717

1991 - Chev. Camaro V8, auto-trans, 96K, good condition with 400watt sound system \$4800 925-373-9439

1991 - Ford F150 Excellent condition, Runs great, looks good, A/c converted,This is a good truck. \$6,250 209-835-2917

1995 - 1995 Ford Mustang GT Convertible New tires, new Alpine CD Changer 75K miles Excellent condition, automatic \$10,500 Firm 925-447-5525

1971 - VW BUS parts. Including motor and tranny. Low low prices. 209-239-5625

4 rally rims and tires:(205/60r15). - fits chevy 5 lug. \$500 o.b.o. (cell# 925-548-4524) home# 925-371-7066

1978 - Chevy Caprice, 2 dr., ac, must sale, \$1,800. 209-492-0270

1996 - Ford Windstar. Loaded, including tow package 100,000 miles. \$6,500 or b.o. 209-836-4142

1989 - Ford Aerostar extended mini-van, towing package, PW, PL, AC, AT, bike rack, 172K miles, smog check and 1 year reg., \$3000 OBO. 925-455-4576

1999 - VW Jetta Black Ext. Tan Int. Automatic, AC, Power Windows, Power Locks, Sunroof. 31K Miles \$17,500. 209-543-6121

1998 - 1998 JEEP Wrangler SE. 4x4, 5-speed, 35,000 miles, red. Factory warranty. EXTRAS: 100% perfect. Never wheeled. Original owner. \$13,950.00 209-763-2669

1997 - Saab900sConvertible 41kMiles/2.3L/30MPG,AM/FM/Cassette/CD, Auto/AC/PwrBrakes&Steer,Leather,Non-smoking/Garaged,ExclCond!Kelly Blu Book \$23k,Sell\$18k 916-353-1135

1989 - Toyota 4x4 pickup,5spd \$3500.00/BO 925-846-5374

1985 - Peugeot 505 Diesel Wagon A/C, AT, AM/FM, sleeps two. Good condition in and out, always garaged. \$750 OBO. 925-484-0672

1973 - 1973 Triumph GT6 new tires,shocks,exhaust and battery,Runs well,no rust,68,000 miles 2200.00 or B.O. 209-838-7711

1994 - Isuzu Rodeo, 97k miles, Std, PW, PS, PD, CC, AM/FM/Cassette, Alarm. Good Condition. \$5900/OBO 925-449-5723

1988 - Toyota supra 89K miles, original owner, AC,PS, Targa roof,white, in excellent cond. \$5500. 925-449-7003

1993 - Ford Bronco - Eddie Bauer, 85k miles, excellent condition. \$7,950 925-516-3768

1996 - Ford Mustang. 3.8L,V-6, 5-speed,AC,CC, AM/FM, Cass., CD player, Alarm, Sunroof,Spoiler. 79,000 miles. \$9,400. 925-373-4888

1997 - Ford Explorer Sport-White, automatic, air, new tires, AM/FM/CASS, PS, luggage rack, 2dr-2wd -- not the bulky model. Like

new, 58K miles \$16,000 925-846-3508

1996 - Chevy Lumina, 4 door, perfect condition only 43k miles - \$7750--This is a good deal! 925-447-8138

1995 - Toyota Tercel DX, 2Dr, Green, 86K miles, 31-38 mpg, maintenance records avail. Asking \$4500. 510-569-3508

1989 - Honda Civic LX, orig. owner, good commuter, \$2,000. 209-836-3041

1995 - Bonneville SE. Excel. cond, leather seats, new AC, red, loaded. Eye-Catcher! \$6,500 obo. 209-858-1521

1992 - Mustang GT 5.0, power everything, excellent condition, acceleration and handling. Come take a look and make offer. 209-836-9082

1990 - Ford Probe GT, fully loaded. 95k miles, 12k on new motor and tranny. New brakes & tires. \$3000 OBO 925-803-1191

1984 - Mercedes Benz 300 Turbo Diesel Grey w/black leather interior, 160,000 miles \$4800 or make offer 925-449-1591

1986 - Cadillac Fleetwood de Elegance. Leather, loaded, immaculate condition. A beautiful well maintained car. \$3,900 209-545-1308

1999 - Mustang GT, laser red/grey, auto, pwr windows, locks, alarm, mach stereo system 46,000 mi. 1 owner. \$16,000 obo. 510-440-8753

1986 - Cad. Cimaron. 85K miles. Orignal owner. Good condition. 1500.00 or best offer. Call between 5:30 & 9:00pm 925-443-7656

1994 - Ford Explorer-Eddie Bauer model,auto trans,CD player, leather seats, sun roof, electronic key, excellent condition, 83,000 mi. - \$8,500 925-462-8097

1994 - Isuzu Rodeo LS, 4WD, 5 speed, V6, Power Doors/Windows, 69,000 mi, exc cond. \$7900 925-449-7275

1974 - Vega wagon 350 LT1, TH400, 12 bit posi. VDO guages. Fast, fun, done right. New everything. Very clean, must see. B/O 209-832-7630

1995 - Jeep Grand Cherokee, 4WD Laredo, 58K miles, great condition. \$10,000 925-454-8982

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1994 - Isuzu Rodeo LS, 4WD, 5 speed, V6, Power Doors/Windows, 69,000 mi, exc cond. \$7900 925-449-7275

Coleman canoe, 15 foot, two man. Includes lifevests. \$100 or BO. 925-373-1255

1999 Honda 9.9 H.P. outboard motor long shaft 4-stroke. Purchased in 2000, new zero hours. \$1600. 925-447-6728

95 Sea-Doo XP, 85hp, Shorelander trailer, Great condition. \$2300. 925-831-3913

260 hp Mercruiser stern drive, transom unit and stern drive only (no engine). \$2500.00 925-455-0859

50 HP Mercury outboard motor. New prop, excellent condition. Hear/see it run. B/O 209-832-7630

CAMERAS

Various cameras, tri-pods, albums,album leaves, misc. photo equipment.....aces-sories,etc.-call 925-735-6002

ELECTRONIC EQUIPMENT

Offer for LP records, mostly classical in sets; 2 component CD players; JBL bookshelf speakers 925-292-7799

Gameboy (B/W) with Gallery 3 game. Excellent condition. \$25/OBO 925-447-2697

Monitors,scanner,misc. computer accessories call on your needs. 925-735-6002

Powerbook 540c laptop computer. 20M ram, 300M HD, carry case, more. \$200. 925-443-8449

12in Kerokee speakers brand new excellent condition. \$350.00 x46710 / 925-437-1737

Wirenuts. \$1 each. 925-484-0475

TV GE 42 Inch Just back from checkup. Great picture. Oak trim cabinet. Will not fit opening. \$250. 925-449-3737

Sega Genesis games. Like new. All 5 are sports. \$15/all. 209-833-1201

HP Draftmaster Plotter, with lots of color ink pens. \$400 or b.o. Leave message. 209-836-4142

New IBM 36GB SCSI hard drive mounted in case for external use with Mac or PC. SCSI cable included. \$175. 925-371-1607

Fisher studio standard digital FM receiver, sony dual cassette deck,philips single CD player, 2 Fisher speakers.excellent condition. All \$200.00 925-371-6592

Dell Inspiron 3800 Laptop PIII 600/96mb/10gig/DVD/14.1in Screen 1100 or best offer 510-910-2883

GIVEAWAY

Queen size bed (mattress, box spring, frame) free to good home. Prefer not to see a good bed go to a landfill. It is about 8 years old. 925-862-0955

Free - Oak bathroom cabinet and sink, 34 inches wide. Redwood lath, old growth, 93 years, possible woodworking project, approx 3/8 inch thk. 925-455-0836

Free, geodesic dome climbing structure 4 ft tall 8 ft diamiter 209-836-3481

To a good home, rabbit, doe, white with black ears and spots. Very friendly. You pick up in Antioch. 925-778-2699

German Shepherd Purebred - 10 year old male with all papers. Obedience training, neutered, good temperament. 925-216-0398

FREE sofa-bed couch GOOD condition, except for 1 cushion torn. Great for college. 925-516-2726

Free 1975 BMW 2002 body. Has mag wheels, good dash. 209-599-7199

Pioneer 6-CD holders for home or car pioneer CD player. I have 6 for you. 925-455-4846

HOUSEHOLD

Queen-sized futon with oak frame from The Futon Shop for sale. \$1000 new, asking \$400. 925-447-1664

HEALTH WALKER PLUS, good condition, \$20. KENMORE PowerMate Canister Vac, good shape, 10 yrs old, \$15. 925-455-4666

Coverted portable central vacuum cleaner with attachments, very powerful, \$125, modern solid walnut officedesk \$100. Offers accepted 925-292-7799

Beautiful solid wood cantanza with three drawers. Antique imported from Ireland. Asking \$200.00. 510-537-7222

Washing Machine - Sears Kenmore top loader - avocado - looks like new - never

failed - \$50. Just bought \$1100 one. 925-447-8415

Butcher Block Table by Boos 24x24x10 34 inches high \$250.00 or best offer. 925-443-1097

Chandelier, Octagon. Antique-brass frame with clear, beveled glass. 21- inch wide. Like new condition. \$40. 925-484-0475

Framed Painting by Local Artist Norma Webb (Collier Canyon Scene 1980) 32 high x 44 wide includes frame \$175 925-447-8613

large solid walnut coffee table and 2 occasional tables w/carved trim, very sturdy \$400/b.o. 209-599-2742

Designer convertible sofa. Custom fabric. Excellent condition. Cost \$1600 new; sell for \$450. 925-449-2230

Stand alone electric stove/microwave combination system; very good condition. \$100 925-447-6728

GARAGE/MOVING SALE! Sat.& Sun., Aug. 25th & 26th 8am-5pm VERY CHEAP! Furniture, clothes, books, linens, lots more. 945 Waverly Common, Liv. 925-449-2229

Leather lift belt,draperies/rods, etc.call on your color,etc. 925-735-6002

2 Stiffel lamps and a 27 inch candlestick, \$100 each. A 20x16 inch beveled mirror in gold frame, \$80, exc. cond. 925-443-3447

Queen size futon, blond wood frame, comfy mattress, terrific condition. come see! asking \$100.00 OBO. 925-600-7953

Kitchen table:48 inch diameter smoked glass, 4 fabric covered chairs, gold and oak trim. \$125 209-823-5845

Ice cream maker, 6qt electric, with book and salt \$10. Padded armchair of office desk, \$10. 925-443-8449

Childcraft Legacy Sleigh Crib, (cogniac color) excellent condition. new \$475.00 selling for \$250.00 OBO Ask for Heather 925-243-9655

Queen-size futon (wood frame+mattress), great condition, \$50 OBO. 925-924-1128

Infant Changing Table-Pine, 2 shelves, includes diaper depot, mat and covers- \$120or best offer 925-216-4834

REFRIG. FrFree Small-10CuFt AptSize 2Dr-Wht. 8yr-Old. Clean, sml-scratches-dings sides/top,only. Revers-Doors. W=2ft/H=5.5ft Will Deliv to Livm. \$110 408-261-1228

Kenmore Stacker washer/dryer. Excellent condition! Super capacity. \$450 obo 209-234-2166

PERSIAN CARPET - 9 X 12 red + navy, circa 1920, excellent condition, appraised \$6,000-\$8,000. Asking \$4,000. Call early evenings. 925-462-3189

Lenox stoneware. 8 place set + servers. Beautiful condition (1 chipped plate). Lifetime quality. This is a BUY at \$275! 925-455-5439

Computer desk: 59-inch high, 42-inch wide, 23-inch deep, simulated-walnut finish hutch/desk. \$40/OBO. 925-373-0314

Vanity with stool, Italian. Art/Deco style, antique gold with mirror table top. Paid \$500 will sell for \$250 obo. 925-447-5049

Washer & Drier, small Sears, \$150. \$175 delivered. 05024, 209-869-1191

52 x 43 Greenhouse window. Black anodized aluminum frame. New in box. \$50.00 O.B.O. 209-832-0988

GARAGE/MOVING SALE! Saturday, August 18, 8:00 a.m.-2:00p.m. Household, clothing, toys, books, furniture, frames. 4811 Kimberley-Common, Livermore. 925-455-5245

Desk, solid oak, w/5 drawers (includes glass overlay top) with matching credenza w/5 drawers, great for printer & fax. Excellent condition. \$400. 925-648-0671

GE Upright Freezer-wht frostfree auto-defrost cap.20.3 cubic ft.4yrs old \$300.00 209-823-9607

Oak entertainment center, door closure for TV, glass closure for stereo equipment, deep, ex. cond. \$200 925-443-8585

For Sale. Sofa and love seat. Gold fabric. \$125.00 925-447-6670

Freezer, 17cf. white, upright, works great. \$100 OBO 209-836-2511

LOST & FOUND

Lost-Jansport backpack, blue in color. Contained assorted books, notepads and Handspring Visor PDA (palm pilot). If found please call 209-824-0387

FOUND: Blue sweater, for female, in Sandia parking lot. Call to identify and claim. 925-846-8919

MISCELLANEOUS

Step 2 Combo Climber. Child climbing structure with slide. Purchased new for \$120. \$70 obo. 925-961-1089

Nice comfortable rocker/swivel chair with ottoman. Clean and excellent condition. Asking \$30.00 510-582-2938

Bandsaw, Crftsman, 2-speed 1 1/8 h.p. work surface 23x27 inch fence, miter, light, owners manual, extra blades, roll around stand locking \$150.00 925-447-6099

Swimming pool diving board and pool slide for sale due to remodel of swimming pool- \$450. 925-846-7536

RBI Hawk 220 Scroll Saw, excellent condition, with floor stand, speed controller, foot switch, multi blades and holders. \$800/OBO. 925-846-5550

Bookcases, rockers, electrostatic air cleaner, mini-blinds, expresso machine, 486 computer-modern-printer \$25, Duraflame logs, computer desk 209-832-1464

Blood pressure monitor, one step auto inflation, like new, \$50 925-447-8613

MTV TRL Tour Sat 9/1; Chronicle Pavilion; Destinys Child, 3LW, Eve, Dream Street. 2 tickets - Sec 107 Row P - Paid \$80ea -- will sell \$75 OBO. 925-487-5617

Baby gate with swinging door, white wrought iron, extends to 8i, excellent condition. Paid \$110 at Cartans. Only \$50. 925-648-0671 925-648-0671

Drinking cups, boxes,new, 2 sizes w/lids. call for more info. 925-735-6002

Sears heavyduty sander (\$70), scroll saw (\$70), electricians prof AC multimeter (\$100) or offers 925-292-7799

49er Tickets(2)vs Seattle, Aug, 25th 6pm, Sec 11,face value 209-918-1437

Marcy Exercise Unit \$200. Mens 10 speed Bike \$30. Toyota MR2 car bra \$25. Full size truck tailgate net \$20. 209-599-7047

Sweet Adelines Harmony Crossroads, womens barbershop chorus rehearses Mondays, 7:30pm, in Pleasanton. New members, visitors welcome. 209-830-7225

"Wedding Dress" Demitrios/Size 8/Long sleeve-Open Back-Beaded/Excellent Cond./Cleaned/Bought for \$850-Sell for \$250 OBO 925-216-4834

Golf clubs Ping I3 Irons 3 thru PW. Blue dot JZ stiff shaft. \$400.00 925-484-0909

New Sports Equipment. XL Harveys wet-suit, 5-wheel Rollerblade skates, adjustable sit-up bench. All new equipment. Sell at half price. 925-932-3839

Crosby, Stills and Nash tix at Concord Pavilion Wed. Sept 19. Great seats, up close in Sec 102 Row E. \$55 - Have up to 6 available. 925-513-8211

ZYLISS vice, plane bench, clamp, glueing press, 4 tools in one. New, in box, never opened. \$125. 925-443-2510

Zoppini Charms and Bracelets for purchase or book a party. Call Susan. Hottest new trend! 209-836-1259

Porch Sale Saturday August 25 10:00 to 4:00 309 North L Street Livermore, Lots of LPs and RPMs 925-447-3809

Couch, contemporary in good condition. Corduroy fabric, color:medium-brown with a mauve hue. \$50.00 925-447-2070

60 X 48 insulated window with grids. White vinyl. \$25.00 O.B.O. 209-832-0988

Century Child car seat, forward facing, 20 to 60 pounds. Excellent condition. \$20.00 209-835-6556

Stationary exercise bicycle: Tunturi 504 Recumbant Cycle with heart rate monitor. Paid \$300 new, asking \$100 or best offer. 925-455-8823

Dining table, wood w/ leaf, cloth/wood seats, better than new, \$250 925-443-8585


Taper Attachment for 9 inch Southbend lathe \$125, Dremel 232-5 flex-shaft tool with foot pedal speed control, and spare shaft \$65 925-443-5549

Pictorial history of World War II, 5 volumes \$60.00 OBO 925-443-1081

Gold wedding band (man). Excellent condition, size 9, two-tone, comfort fit. \$250/BO 209-835-8976

Tall light oak bookcase. Solid oak. 6ft high x 20 in wide x 12 inches deep. Adjustable

Buckle Up



Have you seen the “spot” safety-belt checks throughout the Lab?

Educating the Lab population on the importance of using a safety belt — whether it's driving a personal car or a government vehicle.

INTERNAL TRANSFER OPPORTUNITIES

Tag	Requisition	Classification	Title	Organization
BS	2785	105.1	Associate administrator	Biology & Biotechnology Research Program
PT	2751	105.1	Property administrator	Physics & Advanced Technologies
CO	2746	105.3	Senior administrator	Computation
ME	2672	105.3/105.4	Senior administrator	Mechanical Engineering
BO	2770	105.4	Principal administrator	Business Services
CH	2772	150.3	Principal resource analyst	Chemistry & Materials Science
CH	2774	150.3	Principal resource analyst	Chemistry & Materials Science
FI	2675	151.4	Accounting specialist	Finance
BS	2766	220	Postdoctoral researcher	Biology & Biotechnology Research Program
ME	2732	249	Mechanical engineer	Mechanical Engineering
CO	2737	285	Computer scientist	Computation
NA	2696	295	Political scientist	NAI
EP	2548	371.1	Training section lead	Environmental Protection
PE	2712	405.2	Administrative specialist II	Plant Engineering
TI	2725	405.2	Administrative specialist II	Technical Information
BS	2765	405.3	Administrative specialist III	Biology and Biotechnology Research
EE	2733	405.3	Administrative specialist III	Electronics Engineering
NF	2682	405.3	Administrative specialist III	National Ignition Facility Programs
CH	2787	405.4	Administrative specialist IV	Chemistry & Materials Science
PT	2731	405.4	Administrative specialist IV	Physics and Advanced Technologies
SS	2601	405.4	Administrative specialist IV	Safeguards & Security
BS	2720	519.2	Animal care facility supervisor	Biology & Biotechnology Research Program
ME	2745	539.1	Engineering/scientific assistant	Mechanical Engineering
TI	2759	586.2	Graphics design specialist	Technical Information Department

shelves. \$40 925-443-4778

Parts Cleaning Tank Like New. \$75 925-606-0480

Boppy pillow, \$10. Lightly used, in black and white cow fabric. Over-crib diaper changing table, \$5. 925-417-8894

MOTORCYCLES

1995 - Harley Davidson 883 Sportster. Black, forward controls, windshield, custom exhaust, 13K miles. \$6,000 925-516-1157

1998 - HD 1200 XLH Sportster Evolution - Red, 5.2K miles, original owner, spoke wheels, lots of chrome, custom upgrades, mint condition. Asking \$9,000. 530-644-7820

1998 - Honda Shadow Ace 750. Fantastic shape. 2400 miles. \$3800 Firm. 925-447-0546

MUSIC INSTRUMENTS

Guitar, Washburn Maverick w/Floyd Rose bridge. excel condition. Paid \$700.00 new, will sell for \$400.00 or b.o. ask for Wyl 209-832-1366

Guitar: GSC, acoustic/electric, 6 string, case, like new, \$200 925-443-8034

Suzuki violin, 1/4 size, Wolf violin headrest (1/2 size), both like new. Make offer 925-292-7799

Gibson Banjo RB4 with case, instructional books and video. \$2000. 925-634-2701

Kawai Grand Piano 5 foot 1 inch walnut satin model KG-1C excellent \$800.00 925-485-1981

4/4 violin, case, and bow. Suzuki. Good entry level student instrument. Adult owner, perfect cond. \$250.00 510-581-7553

PETS & SUPPLIES

Blue and gold Macaw, with cage. Goldie is a happy, healthy, talking pet that loves company. \$1200/BO 925-829-6205

Dog House for large dog. Brand name (Ruff Hauz)Weatherproof 2 piece reinforced plastic Excellent condition. \$55.00 925-443-7752

Young pheasants for sale. 925-447-6728

ROSY BOAS \$85 each. 209-239-5625

Dog Training Crate, Large Collapsible Wire, 22W x 24H x 36D, Like New, \$30. 925-447-5538

Free to a good home, rabbit, doe, white with black ears and spots. Very friendly. You pick up in Antioch. 925-778-2699

German shepard/pitbull mix 5 month old female puppy. Playful with good disposition. Shots current. Needs love/attention. Free to good home. 209-836-2465

Large dog cage w/floor tray. Train or transport. Like new. B/O 209-832-7630

Fml Rotweiler, akc papered, 1yr & 8mos, 98 lbs., loves kids & cats, nds tmg, gd home w/lots of play room, indoor/outdoor. 209-839-8343

Beutiful paint filly,started on cutting,exellent bloodlines,would make a greate ranch horse.coming on 4 yrs.your gane my loss

4,000. O.B.O 925-371-5371

Free adult female cat, Tortie coloring, green eyes, spayed, 6 years old. Moving; must give away. 209-835-8065

Chow-Chow Beautiful Red Male 3 years old. Very quiet good natured. Free to mature adults who understand Chows. Not for small children. 925-373-0626

rott pupps 8wks first shots and tail dock mother and father on site large size and good temperament no papers \$200.00 209-858-5876

Rotweiler 8mth male, Dalmation mix 3y male, Queensland Heeler mix 1.5y male, blk female cat 1.5y (fixed/declawed) need good homes. (cell) 510-912-4466

KOI Fish appr. 18in to 24in, healthy & in same pond for 7 yrs;\$150-250/BO. Also some pond supplies. 209-858-4422

RECREATION EQUIPMENT

Backboard and rim with net. \$20. 925-443-3075

Weight lifting equipment. 360 lbs. of weights, and three machines \$300.00 obo 925-443-1097

Snowboard: 149cm Naleboard, Killer Loop boots 9 1/2, Morrow bindings, bag, \$200 - Wakeboard: 136 cm Label, fins optional, no bindings, \$100 925-443-8034

Weslo Cardioglide Plus, push-pull low impact exercise machine. Brand new, in storage for 5 years. \$50.00 925-606-6515

Golf clubs: PING ZING, 3-9,PW,SW...\$350. 925-828-6597

Exercise bench and 220 lbs of bar bells, \$50 510-658-1128

Stepper, Precor model 725e. Only used 1,000,000 steps. \$20 or BO. 925-373-1255

Large Mongoose mtn bike \$50.00. Yakima rack: gutter mounts & 48in bars \$40.00. Steel roof rack for rain gutters w/ canoe attachment \$30.00 925-455-6785

Snowboard for sale. Hazard brand, Size 51, red, with bindings. Great condition \$225 209-599-5071

RIDESHARING

Express your commute, call 2-RIDE for more information or visit "http://www-r.lnl.gov/tsmp.

Modesto - Vanpool, couple seats, 14 passengers luxury van, 8 - 4:30 schedule. Lower cost more and help with the driving (optional). \$112/month. 209-521-9047, ext. 2-5177

PATTERSON - Mostly quiet/sometimes rowdy Vanpool has seats available. Work hrs 7:30-4. Newman, Crowslanding, Gustine, Turlock employees welcome. Kim 209-892-2118, ext. 2-9502

Danville - Carpool needs one driver/rider to complete four-person carpool. Diablo Road/Front Street area. Work hours 8:15-5. 925-831-1569, ext. 2-9858

Modesto/Ripon - Vanpool. 1 seat available and going fast! 15 passenger Van with all amenities. 8:00 - 4:30 schedule. Sleep through the commute. 209-544-6411, ext. 2-2727

SERVICES

Custom picture framing, mating, and design work. 15 years of experience and a large selection of mats and mouldings to chose from. 925-778-4641

Time to paint before the rainy weather arrives. Free estimates. Excellent work. 510-537-7222

Roofing, 28yrs experience, fully insured, do not wait until winter 925-454-9200

Exterior House-Painting - Over 15 yrs experience. Quality work w/free estimates. 925-447-5132

Headshots & Distinctive Black & White Portraiture for actors, entertainers, dancers & musicians. Jim Ferreira Photography 925-449-0107

Need a new Roof or repaires to your existing roof? Give us a call. All Pro Roofing, with over 15 years experience. 925-606-1528

painting interior, exterior. quality work quality paint. neat and clean.free est. 925-447-0589

Custom Built Cabinets, Kitchen, Bathroom, Entertainment Centers, etc. also interior trim, unfinished only, call Tom 925-449-3152

FLOORING INSTALLATION: Carpet, linoleum, Kahrs/Pergo. Reliable, reasonable rates, 25 years exp. Licensed/bonded/insured. 925-516-9510

SHARED HOUSING

Livermore - Room in private residence. Utilities included. Share kitchen, laundry. Single, non-smoker. No pets. \$550.00 mo. (925)449-5976 aft. 4:30 M-F 925-449-5976

Livermore - -Share clean 3 BD, 2BA home, simple furnishings available or unfurnished, full privileges, N/P, N/S; \$500 + share utilities (partial). 925-455-5362

San Ramon - Share 2 bed/2 bath condo. Prefer female. W/D, 2 pools, beautiful location. No pets, no smoking. \$700.00 925-244-1899

Livermore - room available, quiet and clean. 450 / month + deposit and 1/3 utils. 5 mins. to lab. Non-smoker / drinker, no pets. Mature single perf. fem. 925-449-3776

LIVERMORE - - One bedroom, in 4 bed-room house with shared bath. Available immediately. N/S. Long term/short term rates available. 925-216-7286

TRUCKS & TRAILERS

1999 - Utility Trailer For Sale New condition, 4 ft X 6 ft, 13 inch wheels with spare \$475.00 925-447-1664

1991 - ford f150 v8 auto 160k 30k on rebuilt engine and trans. a/c p.s. new cd and speakers. camper shell. excellent condition. 4900 or bo. 510-582-3450

1986 - Trailer/sleeps six/excellent condition; see and offer. 925-735-6002

1990 - Nissan SEV6 King Cab Pickup: ORIGINAL OWNER, 5-speed, AC, AM/FM/cass, cruise, camper shell, bedliner, new breaks, 90k mi., \$4000. 925-455-0935

1977 - Chevy step side, crate motor, transmission rebuild with shift kit, A/c, Oak

bed/stainless runners,cap, to much new to talk about. \$5,200 or obo 209-835-2917

1989 - Toyota 1-ton truck, flat bed with hard-wood stake sides. AC, PS, 5-speed, 2-in receiver with wiring; good shape, runs good; aft 6pm \$4,750 209-832-2056

1996 - NOMAD 27 1/2 ft 5th wheel w 14ft slideout, exe cond, clean, new tires, non-smkr \$17,000 OBO 209-847-8264

1997 - Black Toyota Tacoma with lift kit, bed liner and cover. Under 50,000 miles and in great cond. No money down, take over payments!! Call anytime. 209-474-6062

1997 - Chevy Silverado, Exc. Cond., Silver, 5.7ltr, 2wd, full power, king cab 3rd door, loaded, 14k/obo. 209-652-3730

1976 - 1976 K5 Chevy Blazer 4-wheel drive.Good running condition,good tires,locking hubs,all stock.2599.00 or B.O. 209-838-7711

1954 - Chevy truck, All ORIGINAL 6cyl, 4 speed. Runs good, body is in great shape. Perfect project truck. Two many toys, not enough time. \$2,500 209-599-6449

1978 - Chevrolet Cheyene Pickup 4X4, PS, PB, AT tires, registered, has smog certificate, runs strong. Could use some work. \$2600 OBO 925-828-9174

1990 - Ford F-250 XLT Lariat, Extended cab, Diesel Engine w/Banks Power Pac. \$6250. 209-946-0645

Cab-over camper shell with tool boxes. Free. Photo available. 925-443-7828

1993 - GMC Yukon SLE, 4x4, 84K mi., orig. owner, good cond., \$12,000. 209-836-3041

1985 - Chevrolet 3/4T, Crew Cab, 152K, All Power, Many New Parts, \$3000 925-443-4984

1992 - Chev Z71 extcab, exc cond, 11,000 925-443-6713

1993 - F-150 V/8 5.8Lit engine, auto trans, 4x4,69K Mi, a/c,p/s, tilt whl, c/c, rear slider,alloy whls 10,875 or B/O. Excellent condition. 925-447-8167

1995 - Chevrolet 1500,extended cab,short bed,extra clean. 350 V/8,A/T,P/S,P/B,A/C,3.73 posi-traction,trailer pkg,leather, AM/FM-CD+tape. 77K miles. \$15,000 925-443-0526

1996 - 3/4 Ton Silverado. Good Condition. Tow Pkg. Blue Book Price \$12,085. Make Offer 209-835-5475

VACATION RENTALS

Pinecrest - (Off Sonora Pass Road), 3 bdrm/2 bath, frplc w/wood, microwave, barbecue, pool table, large deck and view up No. Fork of Tuolumne, \$175/wknd. 925-449-5513

Maui, HI - Kahana Reef oceanfront 1BR/1BA condominium. Beautiful two-island view, oceanside pool, and BBQs. Low LLNL rates for year-round reservations. 925-449-0761

HAENA, KAUAI - - Private house and/or studio on the scenic north coast near Hanalei Bay - great beaches, hiking, boating and golf. House-\$125/day, studio-\$75/day. 831-479-3441

SOUTH LAKE TAHOE - 3 Bedroom 2 Bath Chalet nicely furnished,quiet area, all amenities,Park with Lake,tennis, etc.RESERVE

NOW! 209-599-4644

Puerto Vallarta - , Enjoy the holidays in this spacious 2bed/2bath condo on the beach. Available 12/27/01 to 01/03/02 and 01/03/02 to 01/10/02 \$890 ea. wk. 209-545-1308

Maui, HI - Kahana Reef oceanfront 1BR/1BA condominium. Beautiful two-island view, oceanside pool, and BBQs. Low LLNL rates for year-round reservations. 925-449-0761

WANTED

Tomatoes (1-3 bushels) needed for home canning. 925-447-2687

Young person to cut lawns, trim hedges and trees, and generally clean up around house. 925 447-7768 925-447-7768

Wanted inexpensive 20 inch bike with gears, needs work OK 209-836-3481

Do you have scaffolding to rent for a few days (Labor Day weekend) while we paint our 2-story home? 925-240-5505

Looking for a Banjo for sale. 650-359-2619

Wanted: 150W hydrogen fuel cell to power my electric recumbent bicycle. Convection type OK. 925-373-3146

Refrigerator, kitchen table, bed a computer w/printer (for Kids) good shape and reasonable priced, I will be donating to a needy family. 209-832-7112

Housekeeper wanted in Danville to clean couples house every three weeks. Must be reliable, dependable, honest and thorough. 925-648-0671

MOVING BOXES. Large, Small, Wardrobe boxes - we need them all. Please only boxes meant for moving. 925-458-1000

Piano keyboards or synthesizers for under-privileged children. 925-447-2076

Frame for double bed. Must be stand alone and not need a headboard or footboard, and in good condition. Will pay \$10. 925-417-8894

Canning (Ball, Mason, Kerr) jars - pint, quart, and jam size. Pay 10 cents/jar. No cracked glass. 925-417-8894

Will pay well for you to cook my lunch/dinner in your Livermore home for once daily pickup M-F. You must love to cook delicious & diverse dishes. 415-482-6685

Looking for retired Kitchen cabinets to put in garage. 925-487-5985

Moped or Mini-bike, working or not. Teach kids about motors, mechanics and have some fun. Willing to pay a fair price, perhaps up to \$100.00 925-443-7729

Lathrop/Manteca/Stockton two slots open for Carpool riders to join existing, meet in Lathrop. 209-465-2009

Your good used books are needed at the Buenas Vidas Youth Ranch Thrift Store, 116 North L Street, Livermore. Open 7 days/week. Thanks! 925-449-7702

Silver coins! 925-447-4711

Ceramic Tiles: Broken or whole, need for Girl Scout Event in October. 209-835-5031

Looking for Granada High School Alumni from the class of 1991 for 10-Year Reunion. If you are a classmember or parent call Kelly. 925-447-2644

BOMB

Continued from page 1

“the largest as well as the most electronically sophisticated domestic pipe bombs the ATF had ever encountered.”

Rogers said “the electronic aspects of the devices were beyond the expertise of anyone at the ATF.”

Andresen, whose background is in chemistry, electronics and forensics, spent hours pouring over circuit boards, electronic components and other evidence recovered from a storage locker Blach had rented in a transient’s name. In addition, timing circuits from the actual exploded bomb locations were examined at the FSC. “I was brought in to retro-engineer the electronics of the timing circuit and to discover how they worked,” Andresen said.

The discovery of the storage locker was most important and gave the prosecution the break it needed in the case. The transient, who was in jail at the time of Blach’s arrest, revealed the locker to police after recognizing Blach on a bus to court and reading about the bombings in a newspaper article.

According to news coverage of the trial, the locker contained gunpowder, books on how to make bombs, chemicals used to make explosives, electronic circuit boards and tens of thousands of pages of documents, many in Blach’s handwriting.

Nonetheless, evidence was still circumstantial and the prosecution had to link the materials found in the locker to the pipe bombs used in the attacks.

“This guy was very sophisticated in his thinking. He’s very smart,” Andresen said.

Blach is a former Chicago Police Department forensic investigator with a specialty in trace evidence.

“I was matching wits with someone who was very experienced in forensic data, law and courtroom proceedings,” Andresen added.

Although Blach never testified, he used the full extent of his experience and expertise as a police investigator in his defense, advising his attorneys on techni-

cal issues and the line of questioning to be pursued. Even before the start of his trial, Blach had boasted he would outsmart authorities, according to newspaper accounts.

Andresen testified to Blach’s “skill in making electronics and circuit boards,” the chemistry of bomb making, and the assembly of the pipe bombs.

The unique timing circuit system consisted of a digital watch attached to a small relay circuit that could be set to go off months in the future, a homemade circuit board and other common electrical components. Some devices were detonated using a modified car sparkplug. “It was a very elegant approach,” Andresen

finding was important to linking the pipe bombs to Blach, who, while technically sophisticated, was inexperienced in electronics engineering.

Rogers said in a phone interview that Andresen’s “specialized knowledge of electronics was a “tremendous benefit to us” by providing the prosecution with a “rebuttal to experts.”

“Brian spent much of his own personal time working on this,” Rogers noted. “I’m very grateful to him.”

Andresen said this case is similar to the kind of terrorist activity the Laboratory — NAI specifically — is dedicated to thwarting as part of its nation-

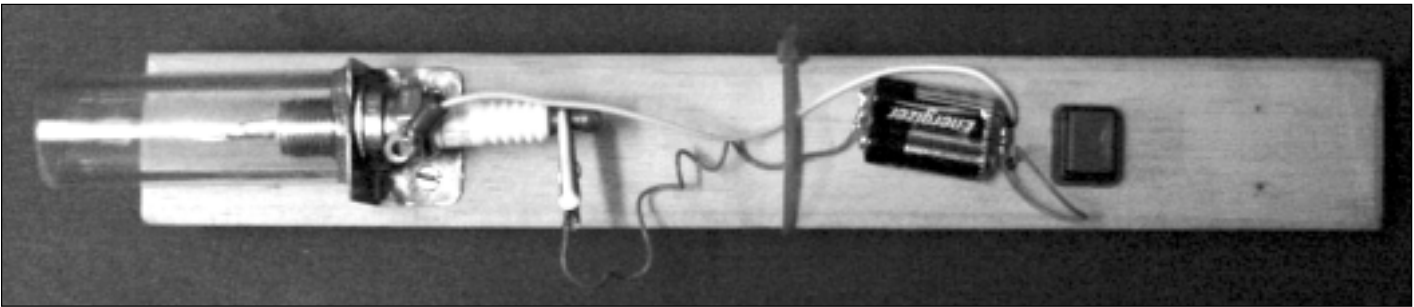


PHOTO COURTESY OF FREMONT POLICE DEPT.

Courtroom demonstration model of a spark plug and battery pack mock-up similar to the one inserted into large pipe bombs. The spark plug’s spark gap possibly supported a small circuit board resting in the explosive material and used to detonate the main charge. The LED simulated the circuit by lighting red when the “on” button was pushed.

said. “The design of these devices showed on-the-edge sophistication.”

Resolving how a sparkplug was adapted to serve as a detonator turned out to be a key to overcoming the defense’s contention that the sparkplug could not conduct the detonating electrical signal in the configuration presented by the prosecution. However, Andresen was able to show that the sparkplug’s central electrode rod had been elongated and fitted with a small machine screw to pass an electrical signal. He made working prototypes of all the timer circuit boards and sparkplug components for courtroom testimony.

Despite the sophistication of the design, the circuit boards were clearly “homemade.” In particular, Andresen discovered that the bomb circuit boards had been inexpertly soldered on the wrong side. This

al security mission. “A case like this is valuable real-world training for us.”

Amazingly, no one was killed or severely injured in the bombings, although extensive property damage was caused by two of the bombs that exploded. The first bomb exploded on the front porch of Fremont Police Chief Craig Steckler. Fremont City Councilman Bob Wasserman was another target.

“These bombs were big and extremely powerful,” Andresen said. “It’s very unsettling to known that people want to cause such devastation. It’s scary.”

In his letter to Vantine, Rogers said Blach presented a great danger “to the lives of innocent people...This defendant had the ability and propensity to commit a mass murder such as what was perpetrated at Oklahoma City.”

NIF

Continued from page 1

box, referred to as a Frame Assembly Unit (FAU). Earlier this summer, NIF began installing the first frame assembly units. By the end of July, Jacobs iron workers and Lab riggers had installed the first 12 main and power amplifier buses. This is a major step toward completing the NIF laser and achieving “first light” in 2004.

Making a Frame Assembly Unit

General Tool Co. (GTC) of Cincinnati, Ohio, manufactures the largest pieces of the amplifier bus, the FAU. There are 192 FAUs in NIF. These are assembled to form the structural backbone of the 48 amplifier buses. GTC assembles the bottom, top, side panels and posts into a unit that resembles a box kite, five-feet-square, eight-feet-high and weighing 1,700 pounds.

The FAU is then finish machined as a unit to achieve the required tolerances for LRU mounting points and sealing surfaces, and to obtain the required smooth uniform surfaces for cleaning. Each FAU is then disassembled into its components and cleaned to exacting standards. Once the components of a disassembled unit are cleaned, they are reassembled into their final form.

When the FAUs arrive at Astro Pak, they are as clean as a dinner plate, but not clean enough for NIF. So Astro Pak personnel precision clean the FAUs and the other amplifier bus parts in their clean room facility located just off-site and then assemble the parts into microbuses.

To assemble the amplifier buses, FAU microbuses are hung on 36-foot-long rails that are exact duplicates of the flat, straight, level rails on which the amplifier buses will hang 12-feet off the ground in NIF. The rails are aligned and pre-loaded to simulate the weight of the amplifier bus so the parts can be aligned precisely as they are assembled.

After the microbuses are aligned and bolted together, the flash lamp windows (which isolate the flash lamps from the expensive laser glass in the adjacent cavity) are installed, bottom covers are attached, and the

amplifier bus is sealed to ensure cleanliness.

Then NIF assembly team conduct three tests on the amplifier bus. One test ensures that it is properly aligned with respect to its mounting points. A second test, for leaks, ensures the amplifier bus will contain the necessary cooling gases. And a third test is conducted to ensure that it is electrically isolated from everything else in the system.

Overcoming challenges

When building a sports arena-size, high-tech tool that’s never been built before with cleanliness requirements similar to those achieved in the semiconductor industry, and tolerances that push standard fabrication technology, it is natural to anticipate challenges along the way.

Precision positioning and alignment was one challenge to overcome when building the special boxes that will hold the amplifier components. These amplifier boxes are the size of a small school bus and yet their parts within must be positioned to better than half a millimeter. The challenge can be illustrated by comparing this activity to locating the seats on a school bus properly to the precision of a grain of sand.

To meet this challenge, four years ago mechanical engineer Don Bartel figured out how to use low-power, off-the-shelf lasers to align the FAU components as they are being assembled in the clean room. This allows the assembly team to align the parts precisely, quickly and cheaply.

Another challenge facing the amplifier engineering team is managing the many vendor and supplier contracts to ensure that parts and supplies are manufactured properly and arrive on time. Some of the parts are off-the-shelf, while others require special manufacturing processes to meet NIF specifications.

Less than two years ago, Tom Kohut joined the NIF Project as the production manager of the Amplifier Assembly Area, a Class 100 clean room in the high bay of Bldg. 381. He hired and trained a team of 15 technicians to assemble the amplifier buses. Kohut is also responsible for scheduling delivery of the hundreds of parts required to assemble an amplifier bus.

During this entire process of assembly, transport

and installation of amplifier buses, a key challenge is preserving the cleanliness of the inside surfaces. In the jargon of the trade, the surfaces are maintained at a Level 83 clean or better; no more than 900 particles bigger than five microns per square foot of flat surface. This is 2,000 times cleaner than the average coffee table that’s just been dusted.

The amplifier buses are maintained at the Level 83 cleanliness or better, throughout the assembly process because once they’re installed, they cannot be readily cleaned in place. These large amplifier buses are the cleanest objects of their size in the world.

Another challenge when making an amplifier bus is the limited set of materials that are able to maintain cleanliness and structural integrity and survive in the amplifier environment where “surface of the sun” temperatures occur when the flash lamps fire.

“The challenges get easier as time goes on and we assemble more amplifier buses,” says Kohut.



NEWSLINE
UC-LLNL
PO Box 808, L-797
LIVERMORE, CA 94551-0808